

Lecture 7

Identity Management I

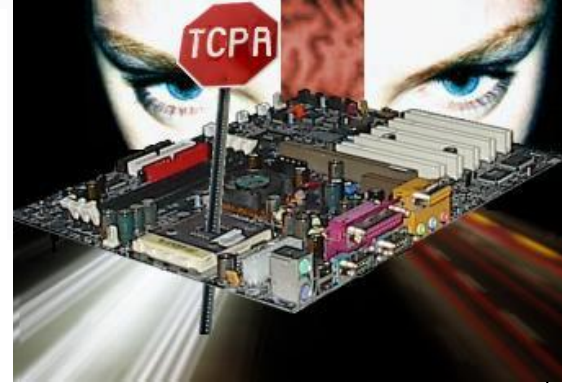
Information & Communication Security
(WS 2010/11)

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T-Mobile Chair of Mobile Business & Multilateral Security
Goethe-University Frankfurt a. M.



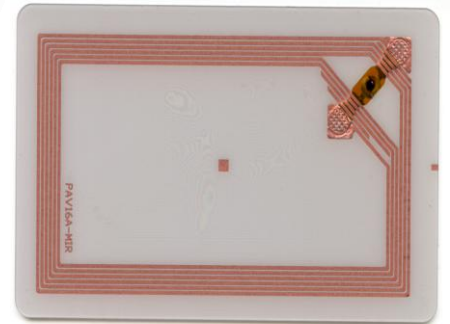
- Introduction
- Identity
 - Different Views of Identity
 - Working Definitions
- Identity Management
 - Account Management
 - Profiling
 - Personal Identity Management



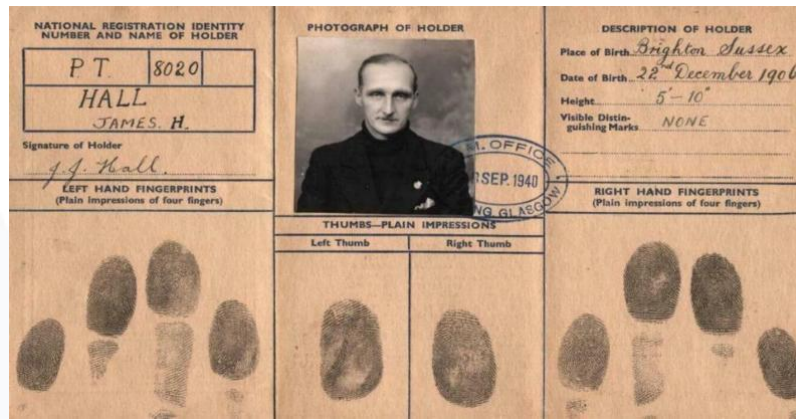
THE UK IDENTITY CARD



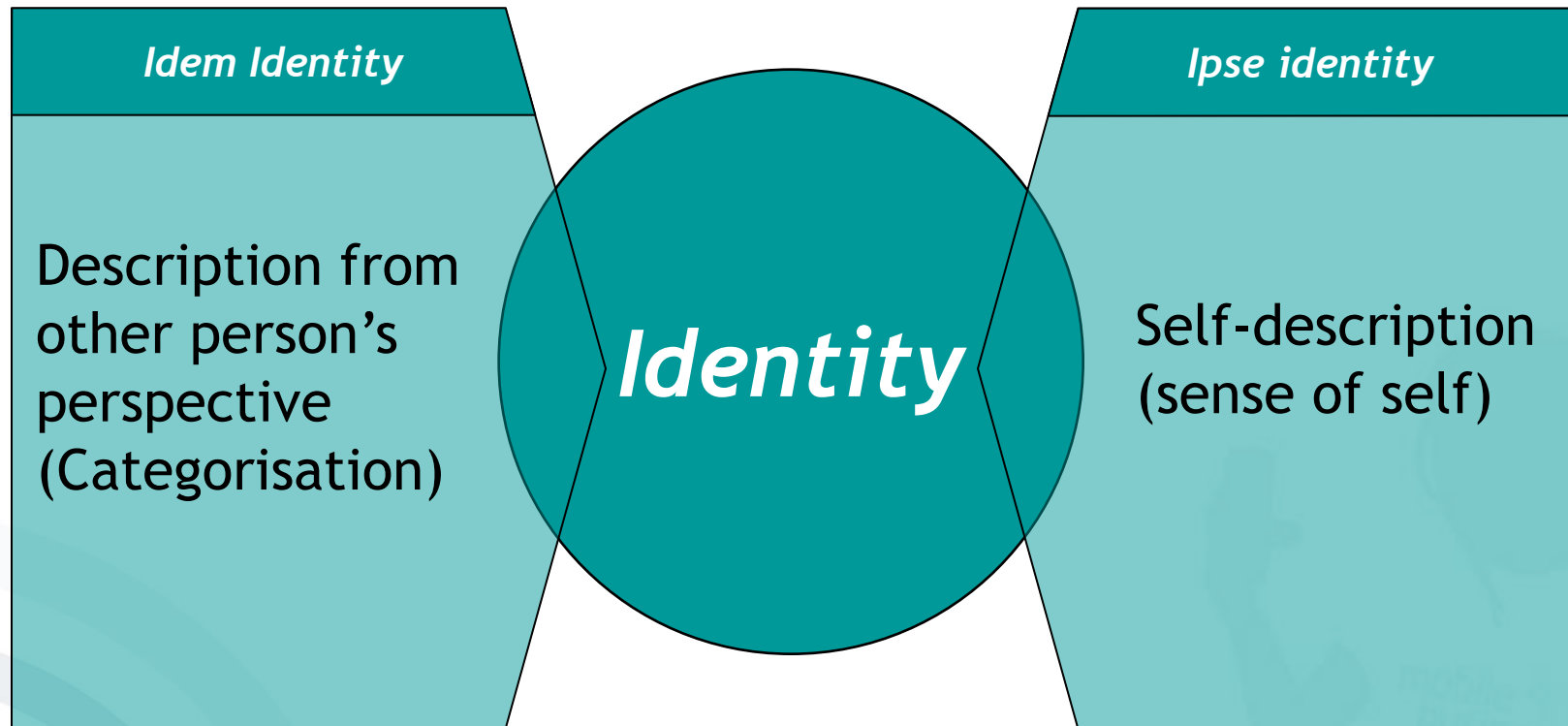
WITHOUT IT YOU'RE NO-ONE



Identity-Related Technologies: Trends



- Introduction
- Identity
 - Different Views of Identity
 - Mental vs. Procedural View
 - Implicit vs. Explicit View
 - View of Identity (Control) according to Durand
 - Working Definitions
- Identity Management
 - Functions
 - Systems
 - Types

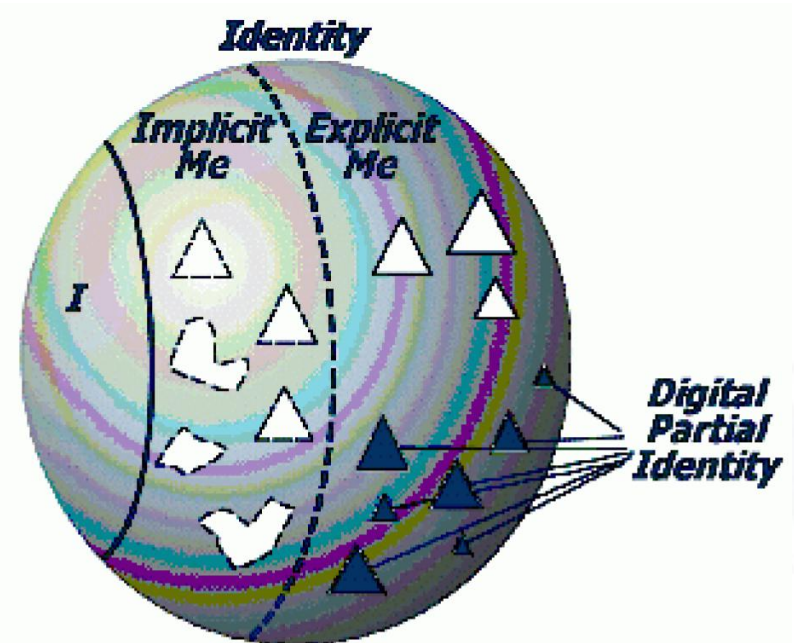


- **Mental identity** (ipse, I)
 - Researched by social/psychological sciences
 - Dynamically changing configuration reflecting, and shaped by, interactions between an individual and its environment
 - Private and endless task to go deeply in ones' own description:
 - “Only I can be responsible for acts done by me.”
 - “I remain myself by being faithful to my promises.”

- **Procedural identity** (idem, Me)
 - Used by technical/administrative sciences
 - Collection of formalized characteristics, which enable identification and authentication necessary for social and economic relations, as well as dealings with the authorities.
 - E.g., a person's name, marital status, date of birth, height, colour of skin or eyes, number of children, nationality, educational and professional qualifications, etc.
 - The choice of these characteristics may depend on the context, i.e. controlling authority, functional needs, etc.

The procedural identity (**Me**) can be further differentiated

- **The I**
the indeterminate first person perspective
- **Implicit Me**
how a person perceives her-/himself
- **Explicit Me**
how this person is perceived and represented



- ***Tier 1 (T1):*** True ('My') identity
- ***Tier 2 (T2):*** Assigned ('Our') identity
- ***Tier 3 (T3):*** Abstracted ('Their') identity
- The different tiers can be distinguished by the factor 'control': ***Who controls the identity?***

- *A Tier 1 (true - 'My') identity is my true and personal digital identity and is owned and controlled entirely by me, for my sole benefit.*
- *T1 identities are both timeless & unconditional.*

- A Tier 2 (assigned - ‘Our’) identity refers to our digital identities that are assigned to us by corporations (e.g. our ‘customer accounts’).
 - *Our* job title (assigned to us by our employer)
 - *Our* cell phone number (assigned to us by our mobile phone operator)
 - *Our* United Mileage Plus number (assigned to us by United Airlines)
 - *Our* social security number (assigned to us by the Government)
 - *Our* credit card number (assigned to us by our credit card companies)

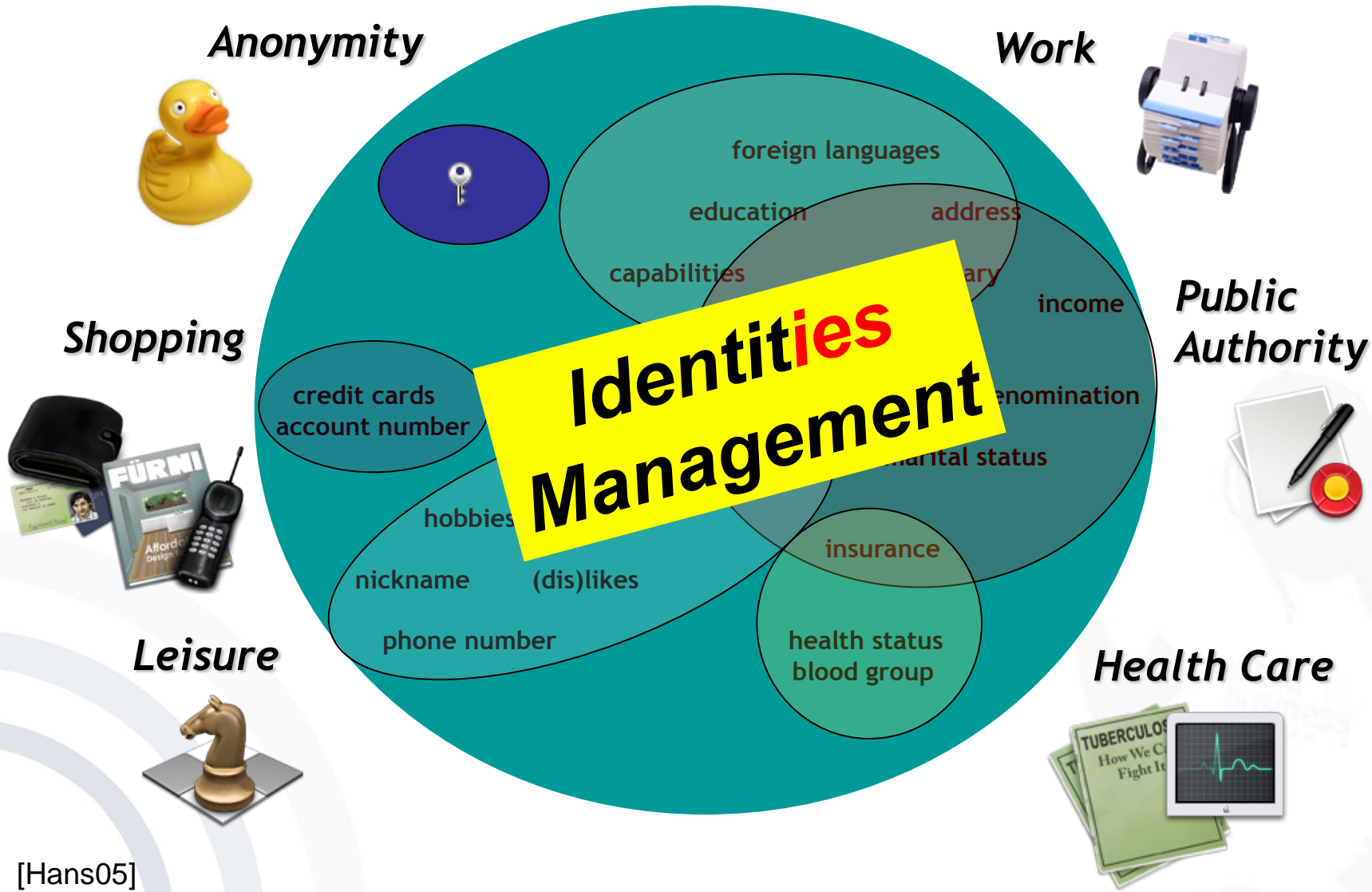
- A Tier 3 (abstracted - 'Their') identity is an abstracted identity in that it identifies us through our demographics and other reputation like attributes, but does not need to do so in a 1:1 manner.
 - T3 identities speak to the way in which companies aggregate us into different marketing buckets for the purposes of advertising or communicating with us.
 - E.g., we're either a 'frequent buyer' or a 'one time customer' etc.
 - T3's are typically based upon our behaviour in our interactions with business.
 - The entire CRM market caters to T3 identities.

- ***Identity:***
The characteristics (attributes) representing an acting entity
- ***Partial identity:***
A subset of the characteristics of an identity

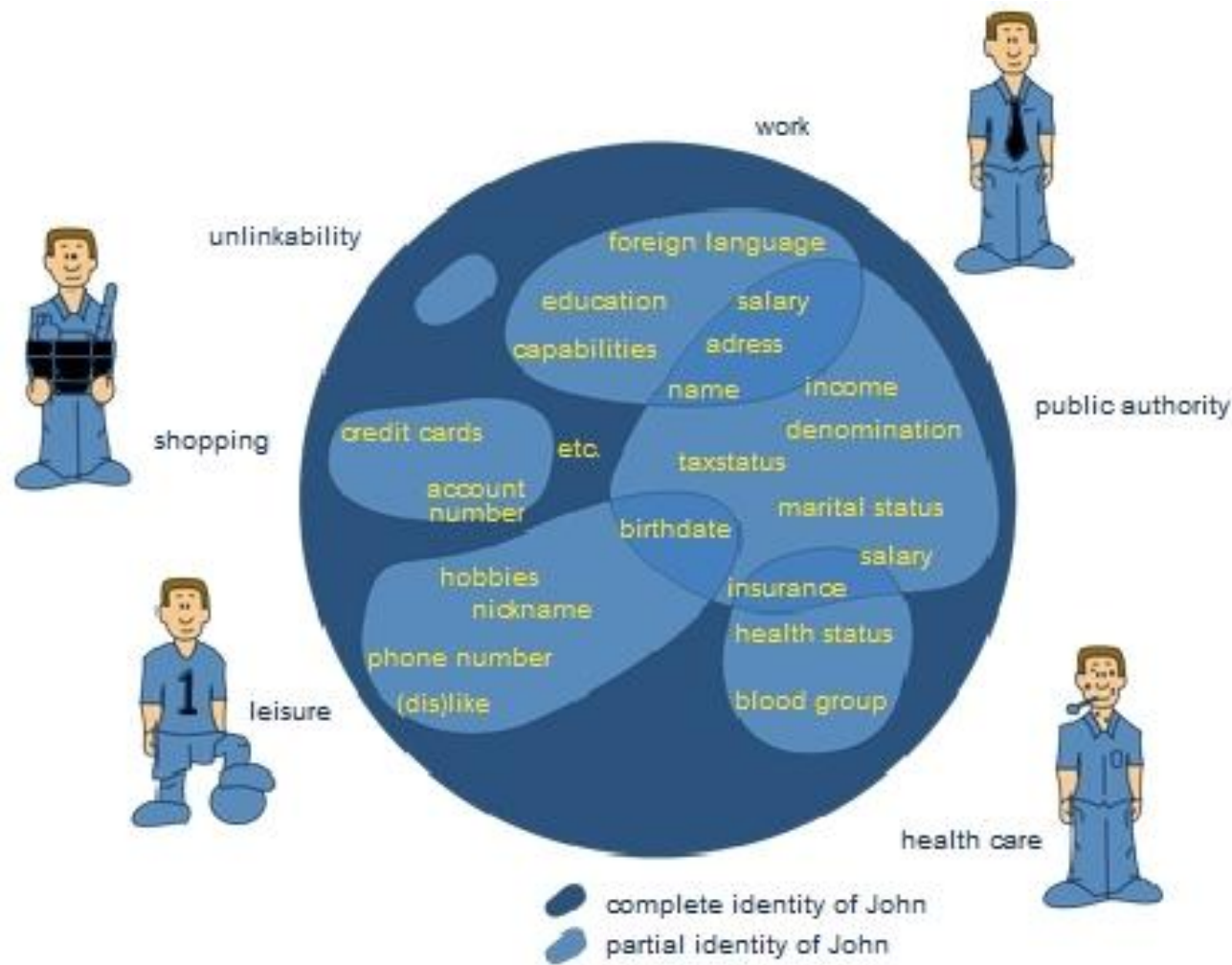
Why are partial identities important ?

- Different partial identities are assigned to and abstracted from an entity.
- The identity of an entity consists of partial identities distributed over different partners of the entity.

[BaMe05]



Identity Concepts: Partial Identities Illustrated | 2



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- Identity
- Identity Management
 - Functions
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 - Types
 - Account Management
 - Profiling
 - Personal Identity Management

- Identity Management (IdM) is often used as a **buzz word** that can have many meanings
 - The management of accounts for employees, customers or citizens. These accounts containing those parts of an identity relevant for an organization (attributes, access rights, roles, ...)
 - Trend towards federations between organizations
 - The collection and analysis of data about individuals allowing for the extraction of useful knowledge on these individuals (profiling)
 - e.g., for marketing or law enforcement purposes
 - The possibility of an individual to manage its procedural identities with different organizations (partial identities) and in this way allowing it in to build a 'healthy' virtual socio-psychological identity.



Identity Management (IdM)

2 sides of a medal with enormous economic potential

ISO/IEC JTC 1/SC 27/WG 5 Identity Management & Privacy Technologies

- **Organisations** aim to sort out
 - User Accounts in different IT systems
 - Authentication
 - Rights management
 - Access control
 -
- **Unified identities** help to
 - ease administration
 - manage customer relations
- **Identity management systems**
 - ease single-sign-on by unify accounts
 - solve the problems of multiple passwords

- **People** live their life
 - in different roles (professional, private, volunteer)
 - using different identities (pseudonyms): email accounts, SIM cards, eBay trade names, chat names, 2ndLife names, ...)
- **Differentiated identities** help to
 - protect
 - privacy, especially anonymity
 - personal security/safety
 - enable reputation building at the same time
- **Identity management systems**
 - support users using role based identities
 - help to present the “right” identity in the right context



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- Provisioning, Enrolling, Choosing
- Binding with Attributes
- Certifying
- Changing
- Unbinding of Attributes
- Deleting
- ...?

- Identity Management Systems (IdMS) are tools that support Identity Management activities. We distinguish
 - 1. Pure IMS main objective is support of identity management functionality, e.g. MS CardSpace (former) Passport, Liberty, Shibboleth, OpenID, PingID, password managers, form fillers
 - 2. Systems/applications with another core functionality, but basing on some identity management functionality, e.g. GSM, PGP, eBay
 - 3. Systems/applications independent from identity management functionality, with some identity management functionality as add-on, e.g., HTML browsers, chat clients

Type 1



Type 2



Type 3



Account Management:

assigned identity
(= Tier 2)

Profiling:

derived identity
abstracted identity
(= Tier 3)

Management of
own identities:
chosen identity
(= Tier1)

by organisation

by organisation

by user himself
supported by
service providers

➔ There are hybrid systems
that combine characteristics

- Tiers of Identity are ordered by the extent of control the individual has over the identity.
My > Our > Their
- Types of identity management are ordered by the (historic) appearance of the respective systems.

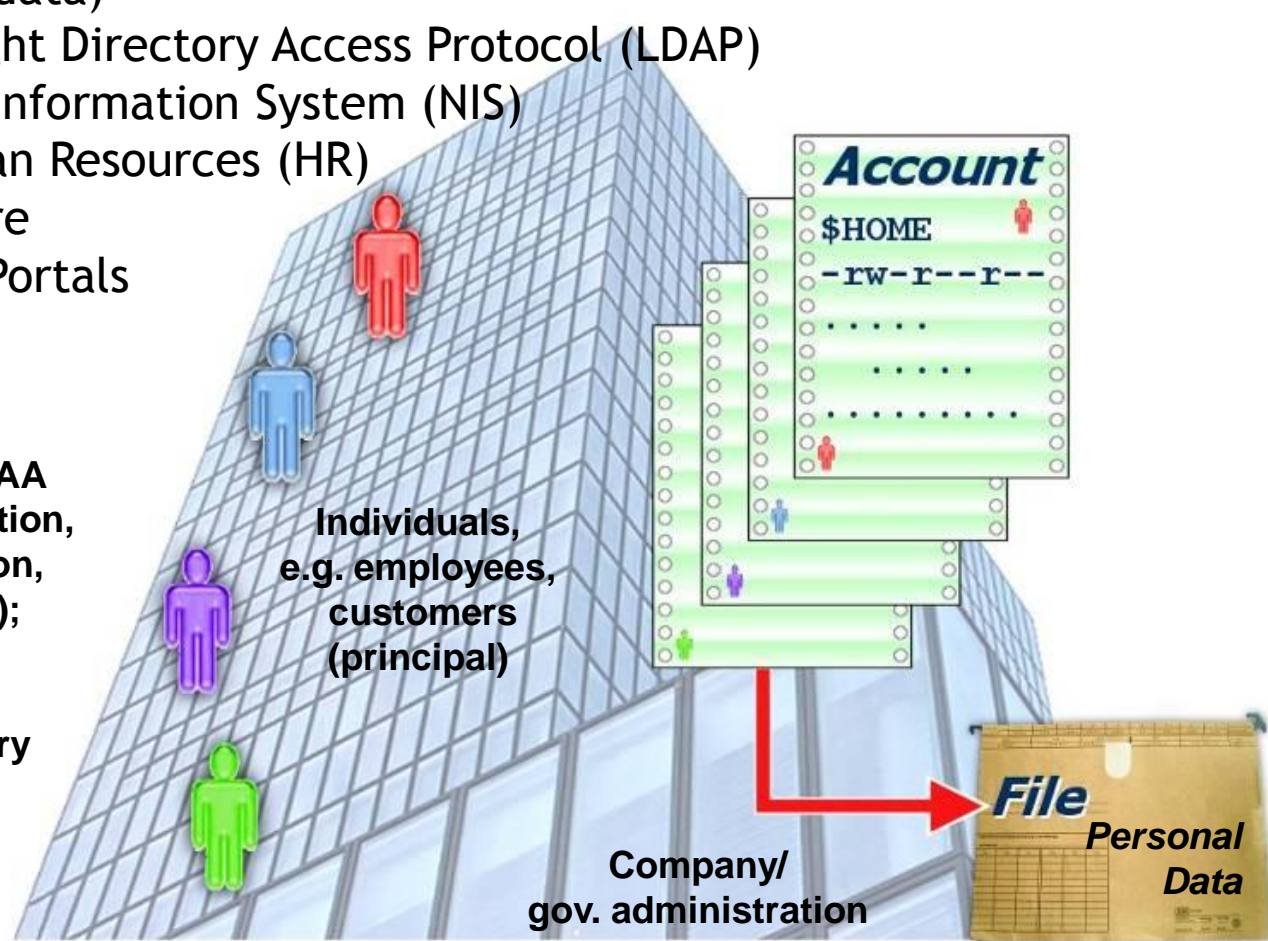
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 - Single Sign On
 - Federated Identity Management
 - Profiling
 - Examples from CRM and the Internet
 - Dataveillance
 - Personal Identity Management
 - Privacy Enhancing Technologies

Type 1: "Account Management"

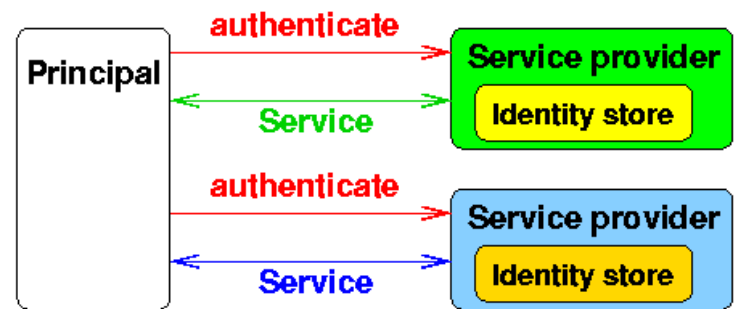
- Identification and authentication (centralized storage of personal data)
- Lightweight Directory Access Protocol (LDAP)
- Network Information System (NIS)
- SAP Human Resources (HR)
- Groupware
- Intranet Portals

Purpose: AAA
(authentication,
authorisation,
accounting);

Means:
e.g. directory
services



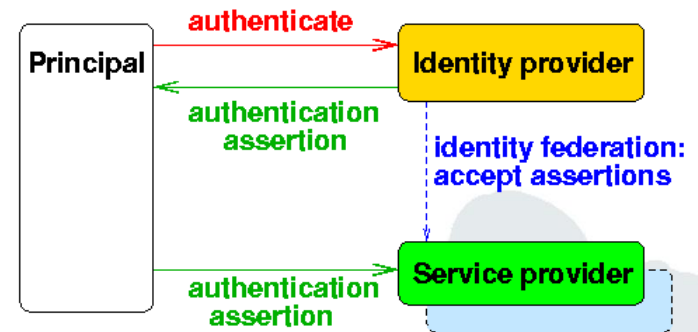
- Account provisioning
- Role & Policy Management
- Access Management
- Internal Single-Sign-On



→ Authentication, Access Control

enterprise-wide infrastructure for
authentication and **authorization** and
accountability over full account live-cycle

- Inter-Company Single-Sign-On
- ‘Linking’ or ‘sharing’ of existing enterprise identities (accounts).
- The source party (identity provider) authenticates the user and vouches for the user to a relying party (service provider).



- Mobile Network Operators already manage identities:
 - SIM = **Subscriber Identity Module**
 - **2.9 billion GSM (SIM)** subscribers (4Q 2007)
 - More countries with SIM infrastructure (220, 4Q 2007) than McDonalds (118, 05.2008) and UN-members (192, 05.2008)
- **Relevance of identity management** grows
 - **Due to legal conditions** of location based services and the processing of personal data
 - “**Who** is allowed to localise **whom when** and **where?**”
- **Trusted party and intermediary role**
 - offers telecommunications providers new business opportunities
 - solves industry problems
 - minimising churn
 - price and tariff discrimination



- **Windows Live ID (since 1999-07/10)**

- Formally known as Microsoft Passport
- Early versions created much controversy
- > 360 Mio registered [MS] participants
- more or less active (> 1 billion authentications per day)



- **Liberty Alliance (since 2001-09)**

- Ca. 150 members, e.g. Sun Microsystems, AOL, American Express
- Claims to be the better federated than Passport
- Complete specification available (Nov 2006)



- **eBay (since 1995-09)**

- > 250 Mio registered participants (2010-11)
- > 90 Mio active users (2010-11)
- Identity Change Management



- **Facebook (since 2004-02)**

- >500 Mio registered users (2010-11)



PKI and Federated Identity

Idea:

- don't do **strong-authentication** everywhere
- get strong **authentication across domains** via federation within a particular user session

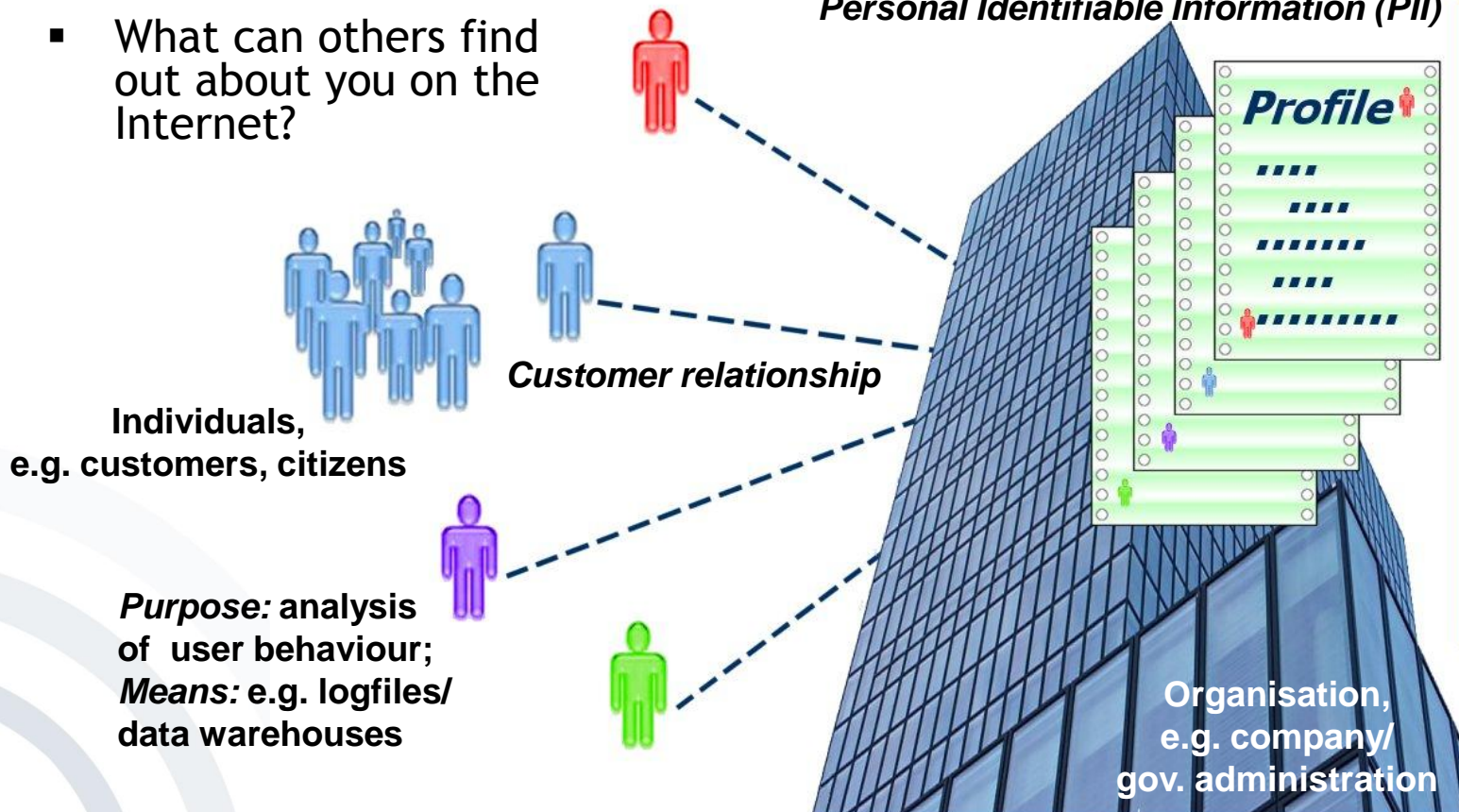
Federation	PKI
Very good for assertions based on a recent/session authentication	Very good strong authenticator
Makes sense for re-use of authentication across multiple domains	Makes sense for secure access to a single domain
Most appropriate for internet-scale applications; high volume and dynamic infrastructure are considerations	Most often used to protect server-to-server or client-to-server conversations
Dynamic attribute support	Weak attribute sharing support
Enables dynamic partnering	Requires predetermined trust chains
Short-lived token	Persistent credentials

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Type 2: "Profiling"

- Analysis of virtual representations of a user
- What do companies and other organizations know about you?
- What can others find out about you on the Internet?

Personal Identifiable Information (PII)



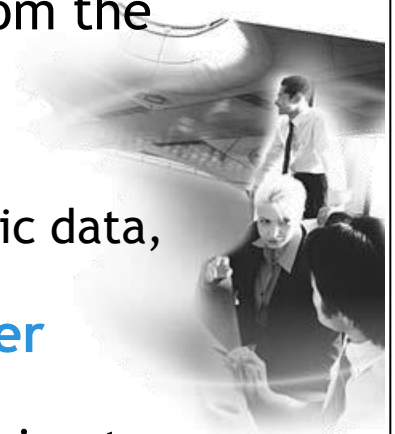
- A Profile is a type of knowledge consisting of patterns of correlated data and it is often built on data collected over a period of time.
- *Knowledge Discovery in Databases (KDD) can be applied to identity information*
 - **Step 1:** data collection; first level: physical
 - **Step 2:** data preparation; second level: empirical
 - **Step 3:** data mining; third level: syntactical
 - **Step 4:** interpretation; fourth level: semantic
 - **Step 5:** Determine actions; fifth level: pragmatic

- *Purpose* is to discover potential
 - terrorists or criminals
 - insurance risks
 - new customers
 - potentially fraudulent employees
 - promising students
 - productive employees

all this is a **type of risk- or opportunity-assessment.**

Example 1: Identity Management for Customer Loyalty

- Offering benefit for getting personal information from the customer (e.g. customer loyalty programs)
 - **Benefit:** Personalised promotions, general discounts, simplified service interaction etc.
 - **Personal information:** Preferences, socio-demographic data, service variables etc.
- Effort necessary for the customer results in **customer lock-in**.
- Users' input constitutes **switching costs** when changing to an alternative provider.
- Highly important in **electronic and mobile commercial settings** (competitors are not far away)
- May **decrease churn rates**
- Closer relation results in **higher value of the acquired customer** (for own or others' business purposes)



Example 2: socio-demographics and milieus

Example of “socio-demographical twins” shows the necessity of a different kind of segmentation model - the Sinus Milieus.

Typical Demographics of an “Established”

- Born 1948 and raised in Great Britain
- Married with two grown up kids
- Professionally successful
- Wealthy
- Leisure time spend in the Alps
- Likes dogs
- Famous and in the public eye

Typical Demographics of an “Experimentalist”

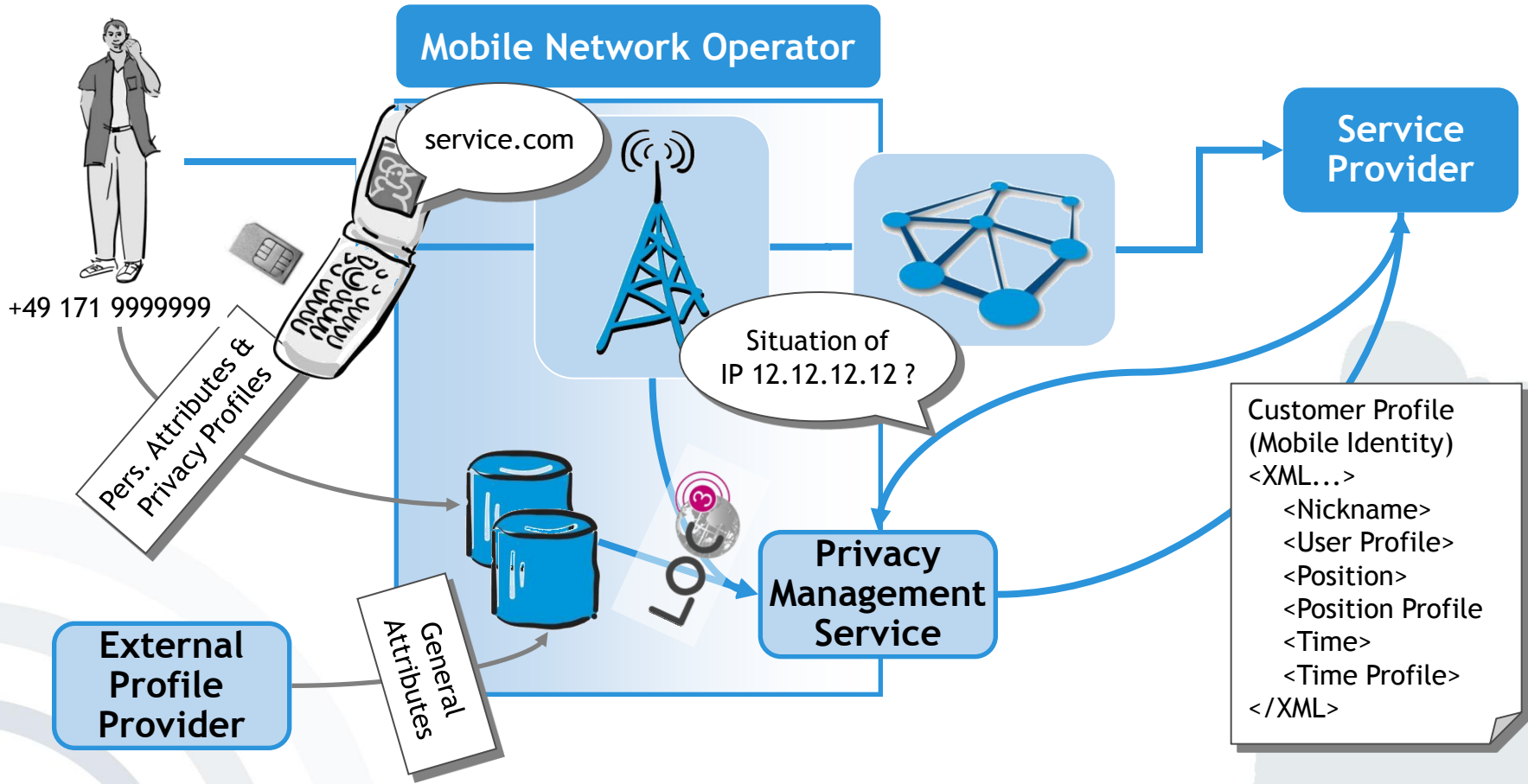
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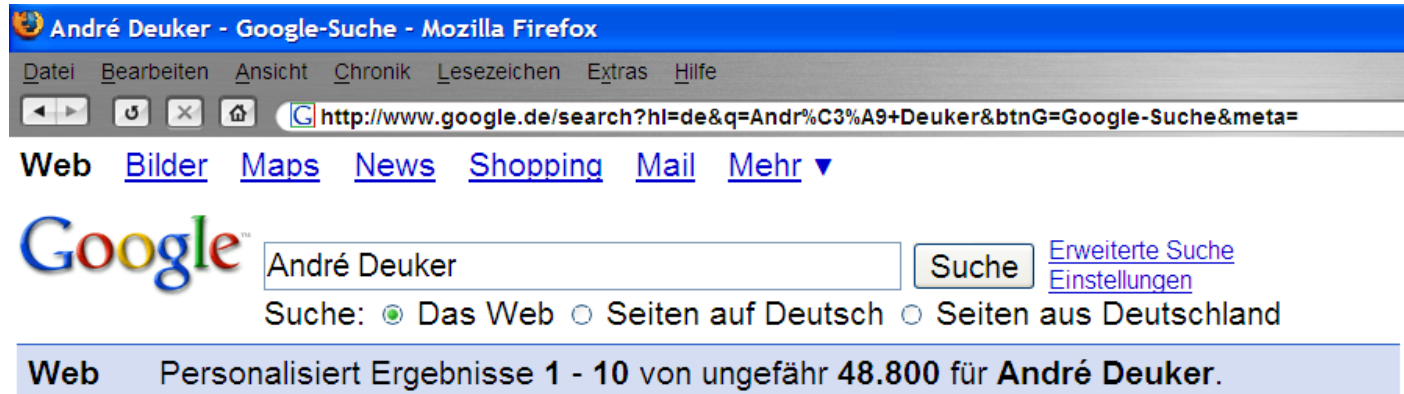
Prince Charles



Ozzy Osborne



- Manual Profiling
 - www.google.com
- Automatic Profiling
 - www.zoominfo.com
- Deliberate Profiling
 - Networking Platforms e.g., www.openbc.com
 - Job Exchange, Partner Search, e.g. love.com



André Deuker - Google-Suche - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

http://www.google.de/search?hl=de&q=Andr%C3%A9+Deuker&btnG=Google-Suche&meta=

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Suche: Das Web Seiten auf Deutsch Seiten aus Deutschland

Web Personalisiert Ergebnisse 1 - 10 von ungefähr 48.800 für André Deuker.

[André Deuker \(Professur f. BWL, insb. Wirtschaftsinformatik ...](#)

Bild von **André Deuker ... Deuker, André**; Radmacher, Mike ... Royer, Denis; **Deuker, André** Komplexe Kommunikation - Der Einsatz von TYPO3 für ...

www.whatismobile.de/personal/personaldetails.php?pernr=474 - 8k -

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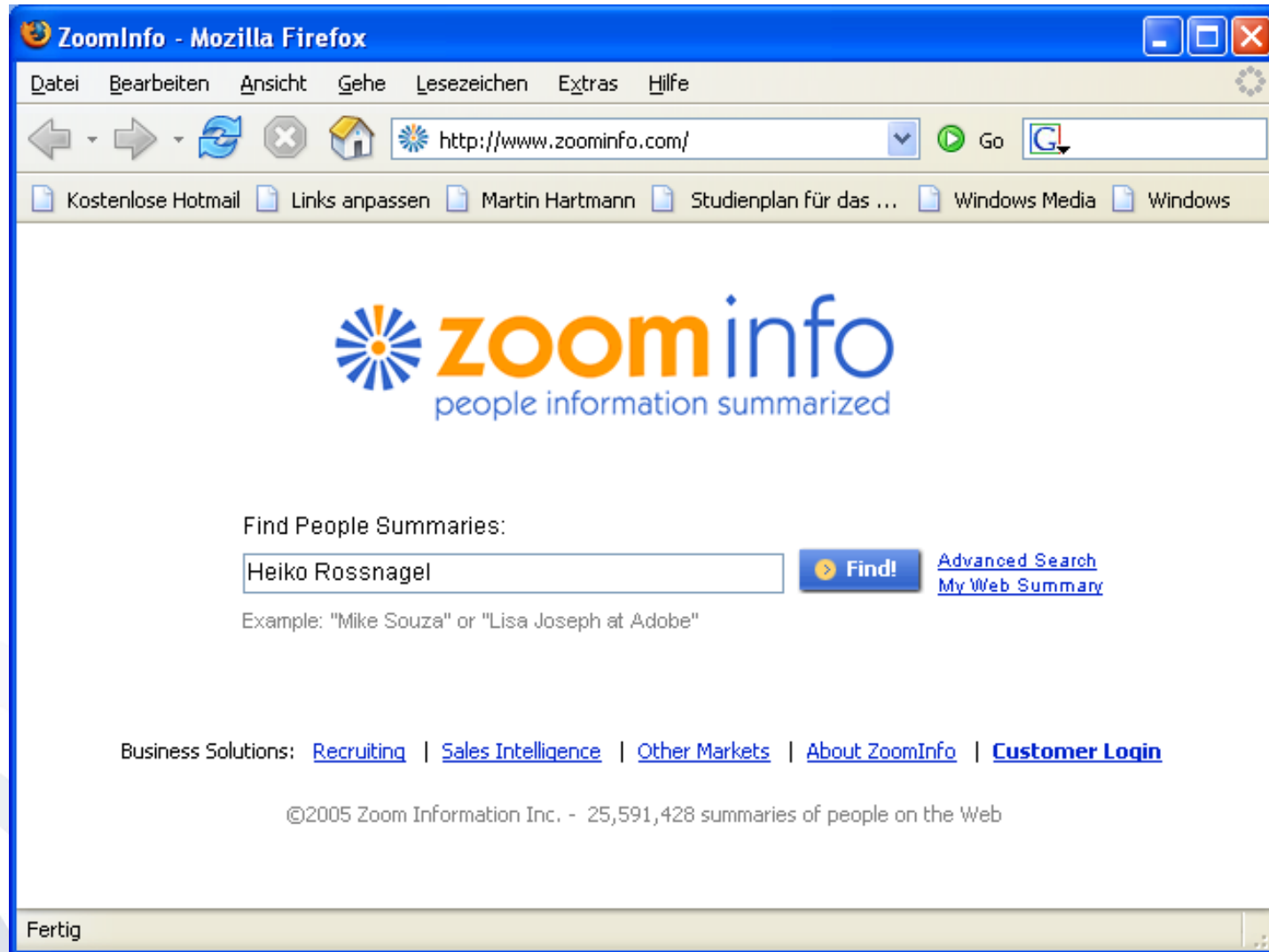
[Mike Radmacher \(Professur f. BWL, insb. Wirtschaftsinformatik ...](#)

Deuker, André; Radmacher, Mike Individualisierungsmöglichkeiten im Mobile TV - Ein werbebasierter Geschäftsmodellansatz In: Proceedings der 3. ...

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Fertig



The screenshot shows a Mozilla Firefox browser window with the address bar displaying `https://www.openbc.com/hp/Lothar_Fritsch`. The page content includes the openBC logo with the tagline "We're Networking People", a search bar with "Suche: NEU!" and a "Los" button, and a language selector set to "Deutsch".

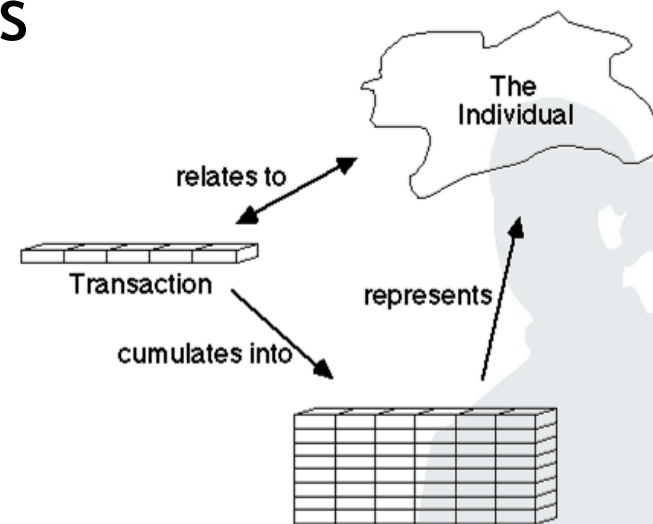
The main content area features a navigation menu on the left under "Willkommen bei openBC." with links to Startseite, Über openBC, Leistungen von openBC, Meinungen der Nutzer, Kooperationspartner, Mobil, and Zur Registrierung. Below this is a call to action: "openBC: Mitglied werden Jetzt unverbindlich und kostenlos".

The profile for "Lothar Fritsch (Diplom-Informatiker)" is displayed, including a photo and a table of business and contact data:

Businessdaten		Kontaktdaten	
Status		Angestellter	
Firma		(sichtbar nur für registr	
Position		Wissenschaftler	
Branche		Wirtschaftsinformatik, I und Datenschutz, M-Co Business, Privacy Enhe	
Ort, geschäftlich		60054 Frankfurt am Mai	

The browser's status bar at the bottom shows "Fertig" and the URL `www.openbc.com`.

- Personal dataveillance
 - low data quality decisions
 - lack of subject knowledge of, and consent to, data flows
 - blacklisting and denial of redemption
- Mass dataveillance
 - dangers to individuals
 - dangers to society



[Clarke1994]

- Arbitrariness
- Acontextual data merger
- Complexity and incomprehensibility of data
- Witch hunts
- Ex-ante discrimination and guilt prediction
- Inversion of the onus of proof
- Covert operations
- Unknown accusations and accusers and denial of due process

[Clarke1994]

- Prevailing climate of suspicion
- Adversarial relationships
- Focus of law enforcement on easily detectable and provable offences
- Inequitable application of the law
- Decreased respect for the law and law enforcers
- Reduction in the meaningfulness of individual actions

- Reduction in self-reliance and self-determination
- Stultification of originality
- Increased tendency to opt out of the official level of society
- Weakening of society's moral fibre and cohesion
- Destabilisation of the strategic balance of power
- And repressive potential for a totalitarian government

You would like to know more about your data?

- For further examples, the following reality documentation might be of interest for you: “Wer hat meine Daten”.
- Excerpt: “Einige Dinge darf jeder wissen: Geburtstag, Wohnort und Beruf beispielsweise. Doch darüber hinaus sind von jedem von uns hunderte von Daten im Umlauf.

Jeder Kauf mit Kundenkarte, jeder Besuch auf Internetseiten hinterlässt Spuren, die von Datenhändlern begierig gesammelt, ausgewertet und verkauft werden. Vorlieben, Leidenschaften, selbst geheime Wünsche von jedem von uns werden gespeichert und in Umlauf gebracht, zu Nutzerprofilen zusammengefasst und transparent gemacht.”

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